

## XXIII.

### EFFECTS OF TOBACCO ON YOUTHS.

By A. C. GORGAS, M. D.,

*Medical Inspector, United States Navy.*

THE use of tobacco by the Cadets at the Naval Academy has been for many years a subject of interest and of discussion both to commanding and to sanitary officers.

Both classes of officers have recognized and conceded that the consequences have been subversive to discipline, and injurious to health.

But a difference of opinion has been held in regard to the propriety of forbidding it by regulation; and great difficulty has been encountered in showing clearly, what every one was prepared to believe, in what way its ill effects upon health were manifested.

And the evasions of the regulations and orders of prohibition have been so frequent in the past, and so much additional police trouble has been caused in their enforcement, that without some showing of the hygienic necessity of prohibition, it was considered by some officers better to relax discipline and permit its use, than to create an additional misdemeanor by forbidding it.

In the absence of statistics no positive proof could be adduced to show the evils of the tobacco habit upon growing youths. Many of the trivial diseases so called, such as headaches, disordered digestion, *malaise*, suspected to be due to indulgence, sometimes surreptitious, in smoking, were ascribed by the sufferer to almost any other possible cause, and much of the evil wrought by this agent was also ascribable in part to other associated indulgences, such as over-feeding, suppers, and drink.

The extent of these minor disorders may be demonstrated by the fact that in 1879 there were 215 admissions to the sick list of this sort of disease, during the nine months of life at the Academy, and 184 during the same period of 1880.

It may be said, in passing, that during the present quarter, since the beginning of which tobacco has been interdicted, but one half as many of this class of diseases have been admitted to the sick list, as during the corresponding quarter of last year when its use was unrestricted.

No one pretends to doubt that the excessive use of tobacco is attended with serious damage to health, and often with danger to life.

In regard to its moderate use by adults, while the weight of recorded medical testimony is against it, the opinion is not unanimous, and the evidence of its injurious effects is by no means conclusive. Its effects upon growing youths will be considered further on.

The active principle of tobacco is an alkaloid called nicotine. It is a pale amber-colored or colorless liquid, volatile, its vapor having the odor of tobacco. It is very virulent, and poisonous to man in minute quantities and with great rapidity.

A suicide died in from three to five minutes after swallowing an unknown quantity ; and a man<sup>1</sup> was poisoned with it, dying in five minutes. Experiments upon the lower animals have shown that it is a rapid poison in very small doses.

It is doubtful to what extent nicotine is concerned in producing the sickness, vertigo, prostration, etc., consequent upon the first indulgence in smoking or chewing tobacco, or the solace and comfort after these first effects have been overcome by perseverance.

Vohl and Eulenberg, in their experiments, were unable to detect the presence of nicotine in tobacco smoke, and they assert that the action of the latter is due to pyridine, picoline, collidine, and other bases of a homologous series, formed by the combustion of tobacco together with hydrocyanic acid, sulphureted hydrogen, and various acids.

Chemically pyridine is  $C_5H_5N$  ; picoline  $C_6H_7N$  ; collidine  $C_8H_{11}N$  ; and nicotine  $C_{10}H_{14}N_2$ .

Pyridine and picoline have similar physiological effects to nicotine, and resemble the latter in smell. The action of these bases is less rapid than that of nicotine, and of the series, pyridine is the most volatile and stupefying. Tobacco itself applied to wounds, open sores, eruptions of the skin, or abraded surfaces, or taken internally, acts as a poison.

In the form of enema it has proved fatal. A case reported in the "Edinburgh Medical Journal" and cited in "Taylor on Poisons," that of a girl aged eighteen, who received a clyster of a decoction of three drachms of common shag tobacco in a pint of water, died in an hour and a half.

On inspection in this case, the heart was found very flaccid ; there were three drachms of black fluid blood in the ventricles. The intestines presented no trace of inflammation or redness in any part, and there was no smell of tobacco (thirty-six hours after death) either in the intestines or in any part of the body. The head was not examined.

In former times, when enemata of tobacco were used to favor the attempts at reduction of strangulated hernia, serious and fatal consequences sometimes followed. Dr. McGregor<sup>2</sup> has seen severe symptoms follow the administration of an enema containing but half a drachm in decoction.

By the mouth, death has been caused by an infusion of thirty grains — and, like nicotine, its fatal effects were very rapid.

A dislodged plug of inspissated tobacco juice from a pipe, accidentally swallowed, caused headache, giddiness, dryness of fauces, and insensibility, followed by copious and repeated vomiting, with return of consciousness and recovery after passing through a restless somnolent state, with malaise and faintness the next day.<sup>3</sup>

<sup>1</sup> M. Fougner, see *Taylor on Poisons*.

<sup>2</sup> *Taylor on Poisons*.

<sup>3</sup> M. A. Marchant, *Journal de Bruxelles*. *American Journal Medical Sciences*, October, 1866.

A smuggler covered his naked body with tobacco leaves with a view to defrauding the revenue of the amount of the duty. The tobacco, moistened by the perspiration, produced poisoning through the skin.

The extreme feebleness of the pulse, its smallness, the cold sweat, the fainting, presented analogies with the condition called by Decaisne, narcotism of the heart, and which he noticed to disappear or diminish when the use of tobacco was suspended or diminished.<sup>1</sup>

Tobacco is rarely used internally as a medicine. It is recommended in tetanus, in which its relaxing power over the muscles might reasonably be supposed to act against the spasm. In the tobacco factories of France it is supposed to be prophylactic and curative to several diseases, especially phthisis.

It seems to be prophylactic against intermittent fevers and itch. Dr. S. P. Crawford, of Nashville, regards it as an antidote to malaria.<sup>2</sup>

M. Melier could not discover that it was preventive or curative in phthisis.

He regarded the effects of tobacco upon workmen in the tobacco factories as injurious to health. Its primary effects, lasting from eight to fifteen days, were, headache, nausea, loss of appetite and sleep, and diarrhœa.

The consecutive effects were manifested by a peculiar grayish tinge of the complexion.

This was, however, uncommon, and observed in certain factories only. From an analysis of the urine by M. Felix Boudet, there was reason to suppose that it contained nicotine.<sup>3</sup>

Many incidents of accidental death are recorded when it has been taken as medicine, or for malingering purposes.

That this substance, to acquire the toleration of which, to say nothing of enjoyment, costs so much in suffering — nausea, vertigo sickness the most profound, cold sweat, palpitation, tremor, and prostration, should be of such extended use, and be so dearly prized as a luxury by every race within whose reach it has come, is a proof that it satisfies some great craving, or supplies some need in our economy.

In its effects upon the system it may be classed with tea, coffee, maté, the betel nut, coca, and alcohol.

In common with some of these, it enables its consumer, in some degree, to resist the pangs of hunger and to endure fatigue and privation.

It is calmative and restorative, within certain limits, and soothing and comforting to mental strain, and to anxiety and distress.

It is anodyne, hypnotic, a companion in solitude, and when smoked, it is eminently a sociable and convivial enjoyment. Within the limits of moderation the evidence of its injurious effects upon adults is not conclusive, although it seems probable, as has been claimed, that prolonged addiction to its use, even within the most moderate limits, is often attended with chronic cumulative poisoning.

<sup>1</sup> Dr. Namias, *American Journal Medical Sciences*, October, 1864, from *Gazette des Hôpitaux*.

<sup>2</sup> *New York Medical Record*, March 15, 1871.

<sup>3</sup> M. Melier. "Health of Workmen in Tobacco Factories." *Gazette Médicale de Paris. American Journal Medical Sciences*, July, 1845.

"In small doses," M. Gustave Lebon says, "that tobacco smoke instantaneously excites cerebral activity, and the intellectual forces, and facilitates digestion. In excessive and frequently repeated doses it produces difficulty of digestion, benumbed intelligence, and clouded memory." I dare say most smokers will more readily recognize the stimulation than the depression thus described.

Indeed, while such symptoms as disordered digestion and associated headache, or dryness of the tongue and fauces, may be put down as the ordinary consequences of unusual indulgence, the benumbed intelligence and clouded memory can only be supposed to follow extreme and prolonged abuse.

In military and naval life tobacco comes in with much of the effect attributed to coca and maté, in times of privation, and in the storm of wind and battle.

Cold, wet, hunger, fatigue, night watches, and long marches seem to be admirable antagonizers of its evil consequences.

The London "*Lancet*" of November, 1870, in speaking of the Franco-German war, says: "If there be one fact that has been more frequently stated than another, it is, that the soldiers engaged in this war — well or wounded — seek the solace of tobacco. The inhabitants of every nation manifest similar instincts, and one of the strongest, is this desire to seek out some substance, the use of which may soothe or stimulate the nervous system.

"The soldier, wearied with long marches and uncertain rest, obtaining his food how and when he can, with his nervous system always in a state of tension from the dangers and excitement he encounters, finds that his cigars or pipe enable him to sustain hunger or fatigue with comparative equanimity. Explain it as we may, this is physiologically true; and medical officers who would not be sorry to see the issue of a 'spirit ration' discontinued, are compelled to allow that the moderate use of tobacco by soldiers in the field has several advantages."

But whatever may be the effects of moderate smoking, — and the term is of course a relative one, depending upon constitution, temperament, occupation, and surrounding circumstances, — the abuse of tobacco is soon followed by symptoms of poisoning, acute or chronic. In regard to the influence of surroundings the writer of this has observed that officers often smoke much more at sea than when ashore or at home, and that in his own case tobacco at sea, or at least on board ship, has infinitely more attraction, and is far better borne than when living at home, where, indeed, it almost ceases to be a habit. In two visits to the seaside in successive summers, and in traveling by rail, the change in mode of living seemed to operate in creating a desire for tobacco and securing tolerance of a large consumption of it, similar to the experience of sea life.

In considering the use of tobacco in excess, besides the chronic and local affections induced, we find very much the same effects as when taken in poisonous doses by accident. Among the former is an inflammatory condition of the mucous membrane of the lip and tongue, congestion and dryness of the mucous covering of the tonsils and larynx.

The inflammatory action also extends to the posterior and sometimes even to the anterior nares, and passes to the conjunctiva, with resulting headache, redness, and lachrymation ; and a peculiar spasmodic action of the orbicularis muscle of the eyelid is experienced, together with intolerance of light on awaking from sleep.<sup>1</sup>

Dr. Laycock thinks the dull, heavy headache, so well known to smokers who have exceeded their allowance over night, to be due to the extension of this irritation to the frontal sinuses.

In extreme cases, he says, there is gastritis. The action of the heart and lungs is impaired by the influence of the narcotic on the nervous system, but a morbid state of the larynx, trachea, and lungs results from the direct action of the smoke. The same observer compares the action of tobacco to that of green tea, exciting to watchfulness, or to dreams which leave no impression on the memory : the passing off of which leaves a greater susceptibility in the nervous centres to impressions, as indicated by trembling of the hands and irritability of temper.

Dr. Wright, of Birmingham, believes it to be a great antagonist of the functions of the nervous system, especially in its relations to the organs of sense, of reproduction, and of digestion.<sup>2</sup>

M. Sichel, in speaking of tobacco amaurosis, says that in his opinion "there are few persons who have smoked during a long period more than five drachms of tobacco per diem, without having their vision, and frequently their memory, enfeebled."<sup>3</sup>

A case of poisoning, with sudden death, is reported by L. L. Dow, occurring in a cigar-maker, forty-nine years of age, and apparently due to excessive smoking and prolonged presence in a room filled with tobacco smoke.

At the autopsy the description agreed with Von Boeck's description of the morbid state,<sup>4</sup> viz. : "Vascular engorgement of the brain and its membranes, serous fluid in the ventricles of the brain, are mentioned in all published reports. The heart is generally empty, and the blood found in the vessels is of a dark red color. The liver, spleen, and kidneys are generally hyperæmic."<sup>5</sup>

As most of the evils wrought by the abuse of tobacco seem to be through its influence upon the nervous system, it is not surprising that mental alienation has been ascribed to it. And a progressive increase of insanity in France has been shown to accompany the increase in the consumption of tobacco.<sup>6</sup>

In a paper by M. Decroix, published in the "Bulletin de l'Association Française contre l'abus du Tabac et des boissons Alcooliques," he enumerates no less than sixteen diseases, the list beginning with cancer of the tongue, and ending with idiocy and premature old age, as resulting from the use of tobacco.

<sup>1</sup> Dr. Laycock.

<sup>2</sup> *London Medical Gazette*, October, 1846.

<sup>3</sup> *L'Union Médicale*, No. 54. *American Journal Medical Sciences*, October, 1863.

<sup>4</sup> Vide *Ziemssen's Cyclopædia*.

<sup>5</sup> *New Remedies*, March, 1881. *Medical News and Abstract*, November, 1881.

<sup>6</sup> *Blatin sur la Nicotine et le Tabac*.

Becquerel<sup>1</sup> says : "Quant aux effets généraux sur les facultés intellectuelles, nous signalerons la remarque faite par M. Danet, et vérifiée par Bertillon, qu'à l'école Polytechnique *les fruits secs* sont de grands fumeurs."

I have seen a case in which symptoms of angina pectoris of a very alarming character, with enormously profuse sweating, and great slowness of the pulse, were probably due to excessive smoking of very strong tobacco.

All writers upon the subject agree that the effects of tobacco upon the young are bad. The mode in which tobacco was used by the cadets at the Naval Academy was perhaps as bad as could have been devised. The cadets were allowed to smoke in their bed-rooms only. The condition of the atmosphere in these apartments, about nine o'clock each evening, was indescribably foul and close.

That persons could get accustomed to it, argues strongly in favor of the tolerance speedily acquired by tobacco consumers. The heaviest smokers among the officers would occasionally find apartments, in their visits of evening inspection, the odor of which would cause a qualm. This condition was peculiarly hard upon non-smokers, room-mates of others addicted to the practice.

These seldom complained; a point of honor kept their mouths closed, but admissions of their sufferings would sometimes be confided to medical officers on occasions of sickness. In cold winter weather, when doors and windows are kept closed, even when the occupants of these rooms had gone to bed, the air breathed by the sleepers must have been a concentration of foulness and poison.

Dr. Charles R. Drysdale, in the "Medical Press and Circular," of February 12, 1873, says: "If the smoking takes place in closed rooms, then not only are the nicotine and other parts of the tobacco taken up in the mouth, but also with each breath a portion of the tobacco smoke contained in the air of the room. The quantity of injurious substance of course becomes the greater just in proportion as the room is smaller and there are more smokers.

"A railway smoking carriage is of course the *ne plus ultra* of unwholesomeness in this respect. With regard to persons who, themselves not smoking, remain in chambers where smoking takes place, they cannot in any way escape the injurious effects of tobacco smoke. If they do not inhale so much injurious matter as the smoker himself, still they take in on each breath a quantity of the constituents of tobacco smoke mingled with air; and to such a degree that he or she who lives in such a room takes in more nicotine than a smoker does who smokes only in the open air. Hence it appears that women who serve in public-houses and cigar divans, are materially injured by a vice which their own sex is innocent of; and this fact may, perhaps, restrain some good-hearted male, who is quixotic enough not to care sufficiently for his own health.

"It is now well known, by the observations of Dr. Kostrál, in the Austrian state tobacco manufactory, that persons employed in tobacco man-

<sup>1</sup> *Traité d'Hygiène.*

ufacture are subjected to many diseases, especially in the case of young women and boys."

It was this mode of smoking which, even if the exact amount of smoking had been equal in the two conditions, made the permitted practice so much worse than the surreptitious. For when smoking was indulged in, in spite of interdicting regulations, the culprit took good care to conceal the evidence of his transgressions by getting rid in some way of the tell-tale smoke and smell. In that case he did not poison his room-mate, and he did not breathe and rebreathe the nicotine and pyridine and ammonia and what-not other products of his pipe, during his hours of sleep.

Of the effects of tobacco upon sexual development there has been little but the most inferential evidence at this school, but almost all writers testify to the direct and indirect perversion of the generative function in those addicted to its use, or exposed to its influence by occupation. Dr. D. F. Lincoln says: "With regard to workers in tobacco, it is said by Tracy, of New York, that they have very small families, quite the reverse of what is the case usually with working people. He found only four hundred and sixty-five children in three hundred and twenty-five families. It is not certain what the cause of this peculiar condition may be, but it is quite probably due in large measure to the premature commencement of work, and to the influence which tobacco has in *checking the sexual development* in young girls.<sup>1</sup> It is certainly desirable to keep young persons under sixteen from its use."

"Tobacco ought to be interdicted to women and young persons whose natural nervous susceptibility is easily excited (*exaspérée*) by its influence."<sup>2</sup>

M. Caron suggests that the greater relative frequency of typhoid fever in males may depend upon the almost universal habit of smoking among men, especially as the habit is so often begun at a very early age, before the subject has attained the full powers of adult life.

This habit perverts the functions of the salivary glands and other organs, and the economy is injured by the absorption of poisoned secretions.<sup>3</sup>

Many fatal cases of children and youths from smoking and chewing have been recorded.

A case of death is reported in the "New York Medical Record" of October 6, 1877 — that of a boy who was admitted into the Melbourne Hospital suffering from the effects of chewing, complaining of headache and dysentery. He became gradually unconscious and paralyzed, and died on the following day.

The following case is one described by Passed Assistant Surgeon M. H. Simons, United States Navy, in a letter to Medical Director Gihon, who has kindly sent it to me. The case is not given in full, and the details of treatment are omitted. The medical attendants considered it one of tobacco poisoning, but had some doubts.

The patient had never lived south of Boston, says Dr. Simons, intending to intimate, I suppose, that malaria was an improbable factor in his case.

<sup>1</sup> *School and Industrial Hygiene*, 1880.

<sup>2</sup> Arnould, *Nouveaux Éléments d'Hygiène*, 1881.

<sup>3</sup> *La France Médicale*, 1877, No. 87. *Philadelphia Medical Times*, January 19, 1878.

H. C., aged sixteen years ; born at Portsmouth, New Hampshire ; phlegmatic temperament ; large for his age ; height five feet eleven inches ; weight two hundred pounds. Has been addicted to smoking tobacco for more than a year.

On Thursday he smoked more than usual, a pipe, followed by two or three packages of cigarettes, "as fast as he could."

This was followed by nausea, and for two days he suffered with anorexia and constipation. On the Saturday, about two o'clock A. M., he was seized with severe occipital and cervical pain, and vomiting, and colicky pains in epigastrium. Dr. S. saw him at ten P. M., and found him complaining of pain in the head, neck, and abdomen ; face flushed, right tonsil swollen and inflamed, photophobia, pulse 102 and full, tongue red, skin dry and hot, occasional vomiting of greenish fluid, and very restless.

The next day, Sunday, May 8th, had slight fever, swelling of tonsil abated, great restlessness, severe pain in back of head and neck.

*Monday.* — Face pale, excepting a narrow streak of red extending from chin over both cheeks, pulse 100, tongue furred and swollen, tonsil slightly swollen and ulcerated, fever slight, skin moist, photophobia, speech incoherent, bowels constipated, constant rubbing of his head, rolling from side to side and kicking, pupils slightly contracted.

*Tuesday.* — Pulse 62, full and firm, pin-head pupils, tongue coated, dark in centre, edges red and much swollen. Articulation very difficult, skin cool and moist, bowels constipated, restless.

In afternoon had a large and very foul operation of the bowels after a dose of Sal Rochelle, and passed a great quantity of dark colored urine.

Tongue greatly swollen, articulation impossible. He obeyed orders sharply given, otherwise noticed nothing. No sleep since noon of Monday. Tips of fingers and feet cold and blue at two P. M. until nine P. M., when he became feverish and more restless.

*Wednesday.* — Pulse 70, skin moist, temperature 101° ; tongue swollen and covered with sordes, constipation, abdomen tympanitic, can swallow but cannot articulate, very restless ; slept two hours in the afternoon ; coldness of extremities came on at three P. M., not followed by fever. Slept a little during the night. At nine P. M. talked incoherently, but could not articulate plainly.

*Thursday, May 12.* — Restless and delirious in the early morning, but rousable ; pulse 78, full and firm, skin moist, tongue less coated and less swollen, articulation plain, said there was no pain in occipital and cervical regions.

From this time the patient improved and was about again in ten days.

The treatment was by cathartics, stimulants, ergot, and quinine.

There seems to have been paralysis of vaso-motor nerves of tongue, base of brain, and medulla, and consequent congestion. The gustatory nerve was apparently all right, for he made wry faces and objected to the quinine and first doses of ergot.

This case, although somewhat obscure, is a very interesting one, and in the sequence of symptoms corresponds with the result of the observations of several writers.



The use of tobacco by youths can never be regarded as moderate. It is generally excessive in the literal sense of the term, but its effects, even when but little indulged in, are those which characterize excess in adults. The depressing effect of tobacco upon growth by diminishing the forces concerned in tissue change, its effect upon the heart and pulsation, the disturbance of muscular coördinative power, of ability to concentrate the mind upon study, the dyspeptic troubles, impairment of vision, headaches, and the retardation of sexual development and disturbance of that function, are conceded by most observers, and clearly demonstrated by many, as has been already shown.

Dr. Richardson says: "As the human body is maintained alive and in full vigor by its capacity within certain well defined limits to absorb and apply oxygen; as the process of oxidation is most active and most required in those periods of life when the structures of the body are attaining their full development; and as tobacco smoke possesses the power of arresting such oxidation, the habit of smoking is most deleterious to the young, causing in them impairment of growth, premature manhood, and physical degradation." Dr. Gihon, in his report on this subject,<sup>1</sup> says: "That so many adults use tobacco with apparent impunity, or even admitted benefit, is no argument in favor of its use by growing lads, for while tobacco, by arresting molecular waste of tissue in the mature man, may help to maintain the integrity of the organism, in the adolescent this very effect is detrimental, since it retards that progressive cell-change upon which the advanced development of the body depends."

At this Academy instances of almost all the evil effects of tobacco have been brought to the notice of the medical officers. Many of the cases of "irritable heart," supposed to be induced by gymnastic exercises, I believe to be caused by tobacco.

A cadet, aged twenty, was ill in the sick quarters with tonsillitis, accompanied with moderate fever. I noticed great irregularity of the pulse, together with frequency, 106 to 112, not to be accounted for by other symptoms. Upon his recovery from the tonsillitis I found the intermittence of the pulse continued, although less marked, and the beat still over 100, and excited to 120 or more upon slight exertion. No evidence of organic cardiac disease. He was of a very pale complexion, although of large frame and fine muscular development. I interdicted active exercise, drills, and the gymnasium, and enjoined rest and the avoidance of violent exertion. But no improvement was perceived after a fortnight's rest. Careful questioning elicited the fact that he was an inveterate smoker. He smoked all the time he was in his quarters, when not "turned in," pipes, cigars, cigarettes.

I urged upon him the importance of trying the effects of discontinuing this habit, and he promised me to do so. At the end of a week I found his pulse 76 and perfectly regular. I had concluded too rapidly that his disorder was due to over-exertion in the gymnasium, but this was no doubt a "tobacco heart." He resumed his athletics, trained for the tournament, in

<sup>1</sup> *Sanitary Report of United States Naval Academy, 1879.*

which he took a distinguished part, and had no further trouble. I have seen several other cases of cardiac disturbance among the gymnasts, in which recovery has followed abstinence from tobacco without discontinuance of exercise.

A case of gastric disturbance, traced to immoderate smoking, was characterized by obstinate vomiting which lasted just one week. In this case the pulse was normal, there was no fever, and the temperature was lowered to 97° F.

The derangement of muscular coördinative power is one of the most striking of the ill effects of the tobacco habit observed at this Academy.

Professor Oliver, head of the Department of Drawing, has noticed this effect for many years. In these cases there is not only tremor and inability to perfectly control muscular effort, but there seems also to be some other defect, mental or visual, by which the direction of lines is not properly understood or perceived.

A most remarkable example of this I append to this paper, in the form of a tracing<sup>1</sup> of a drawing made by one of the cadets, partly when in his normal condition, and partly when under the influence of tobacco smoking. It has been kindly given me by Professor Oliver, with the following letter:—

*"Dear Sir, — I wish to call your attention to the accompanying drawing, or tracing of a drawing, made by a fourth class cadet at this Academy. The drawing shows in parts the effect of the use of tobacco by the cadet within some four hours of the period during which he received instruction.*

*"The parts in red are those executed on the day in question, and under the effects of recent smoking. You will observe a certain tremulousness and uncertainty of line (and this in my experience is one of the most important points), and a very unfinished appearance of the parts in red, as though the cadet had begun to make an effort and had then suddenly lapsed into carelessness and indifference. The effects of smoking on muscular action have come under my observation frequently during a service of fourteen years in the Department of Drawing.*

*"The effect of smoking on cadets learning to draw is as unmistakable as it is held to be by trainers on men training for a boat race.*

*"As regards drawing, tobacco has a specific effect on the coördinating faculty, which is used in the act of drawing in a very delicate and complicated manner. In an experience of fourteen years, many thousands of drawings having passed through my hands, I have had occasion to challenge cadets on their use of tobacco in smoking, as evidenced by their work, and I have in no instance made a mistake.*

*"I should say here that the tracing is not so minutely accurate as it ought to be, and does not show so plainly as it ought the peculiarities of line that smoking is apt to produce, but it serves to illustrate.*

*"Very sincerely yours,*

*MARSHAL OLIVER."*

<sup>1</sup> This tracing has unfortunately been mislaid since this paper was received. — EDITOR.

Dr. B. Joy Jeffries says that tobacco will cause color-blindness.

I first joined the Annapolis station in 1873, when I took charge of the Naval Hospital near the town, and was then for the first time, although indirectly, connected with the Naval Academy.

At that time the two upper classes were allowed to smoke. Of course every man upon entering the second class became a smoker by right of seniority and in virtue of promotion. There was a smoking room for the cadets, where the leisure hour was spent, which would have been better employed in the play-ground.

The objectionable features of this room became so prominent that long before the order prohibiting smoking was issued it was closed.

In December, 1875, a board of medical officers was convoked by Rear-Admiral C. R. P. Rodgers, Superintendent of the Academy, to report upon the subject of the effects of tobacco upon the cadets. This board, consisting of Medical Inspectors Gihon and Gorgas and Surgeon Bright, strongly recommended the prohibition of its use in the Academy. Accordingly, Admiral Rodgers issued an order forbidding the use of tobacco in any form by the cadets.

In 1879, however, this order was rescinded, and the use of tobacco was permitted to all the cadets in the Academy. I have already described the condition of their sleeping apartments under this state of things.

It was a common remark last spring, that the cadets looked pale, and this was very striking when they were drawn up in line at "formations." And indeed they might well be expected to be pale, for very few of them slept in any other than a poisoned atmosphere.

At the beginning of the present academic year, upon the return of Rear-Admiral Rodgers, to the superintendency, the interdiction was renewed, to the satisfaction of everybody connected with the management of the Academy, and to the great joy of many of the cadets. Of all the officers here who, in 1879, had favored the plan of unrestricted permission to smoke, none failed to confess that the experiment had been a failure.

There has been but little trouble in enforcing this regulation, and I believe that the violations of the order are not numerous.

The Board of Visitors of the United States Military Academy at West Point, for the year 1880, expressed "surprise and regret" that the use of tobacco was permitted there, and recommended its prohibition.

An order forbidding "the use of tobacco in any form by the cadets" was issued in June, 1881.

The two great national Academies have thus taken a step forward in a matter of great hygienic importance, and have set a good example to the educational establishments throughout the country. I trust that in the future neither Academy will furnish any statistics of the evil effects of the tobacco habit.